Appalachian Technical Services,Inc.

AQUATIC MONITORING REPORT FOR AQUATIC SAMPLE SITE BRFK-3 LOCATED NEAR ROARING FORK IN WISE COUNTY, VIRGINIA

Prepared for:
Red River Coal Company, Inc

Authored by:

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ATS PROJECT NO. 1199.01

August 2015

I. INTRODUCTION

Appalachian Technical Services, Inc. was contracted by Red River Coal Company, Inc. to conduct aquatic monitoring near Roaring Fork in Wise County, Virginia. This report represents the fall 2015 aquatic biological assessment of aquatic sample site BRFK-3. The permit boundary and sample site location are shown on the attached topographical map in Figure 1.

II. METHODS

General locations of all sample sites were selected by a Virginia DMLR biologist. However, the exact site locations may have been relocated by ATS senior biologists due to site conditions (*i.e.* low flow, lack of riffle habitat, etc.) and accessibility. Aquatic sampling site BRFK-3 was located on Roaring Fork approximately 50 m upstream of the confluence to Pine Branch (37.00022; 82.72245).

Data collections for the aquatic monitoring consisting of habitat data, macroinvertebrates, surface water grab samples and physiochemical water quality data were collected on 18 August 2015 by ATS Biological Technicians James Breeding and Brian Bledsoe.

A. Habitat Assessments

Rapid Bioassessment Protocol (RBP) high gradient data sheets were used to assess the habitat for each stream. The RBP sheets score each site's habitat based on 10 criteria with 1 - 20 possible points each (for a max total of 200). Based on the *2008 Methods for Assessing Biological Integrity of Surface Waters in Kentucky*, *Revision 3* (KDOW 2008), stream habitat in the central Appalachians Ecoregion is considered not supporting its designated use if the total score is less than or equal to 116 total points. Habitat must score 117 – 159 to achieve a partially supporting criterion. To qualify as fully supporting habitat, it must score at least 160 total points. Copies of the stream habitat data sheets are attached in Appendix A.

Permit No. 1101760

BRFK-3

Scale: 1" = 2000'

Red River Coal Company, Inc.
Sample Site BRFK-3

Figure 1: Location Map
Permit and Aquatic Site Locations

Designed By	Drawn By	Checked By	Date
CLI	CLI	TNL	09/14

Appalachian Technical Services, Inc.
OFFICE-STATE

Quadrangle	Coordinate System
WHITESBURG-NORTON APPALACHIA-FLAT GAP	VA NAD 83
Drawing Number: 1199.01-Y-AS	Sheet: 1 / 1
Project Number: 1199.01	Scale: 1"=2000'

B. Aquatic Macroinvertebrates

Macroinvertebrates were collected using the single habitat approach as described in sections 7.1.1 and 7.3.1 of the *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition* (Barbour *et al.* 1999).

Macroinvertebrates were collected by agitating a riffle area of 0.25 meters in front of a standard size (500 Φm mesh) kicknet. This process was repeated eight times to achieve 2 square meters of sample area. Upon collection, samples from each site were placed in individual containers of 95% ethyl alcohol, labeled, and returned to the lab.

Subsampling procedures followed methods within Appalachian Technical Services, Inc.'s Virginia Department of Environmental Quality approved *Quality Assurance Project Plan for Biological Monitoring, 2010* and resulted in the identification of approximately 110 (±10%) individuals. All macroinvertebrates were identified by a North American Benthological Society certified taxonomist to family level with the exception of Chironomidae and Oligochaeta.

Macroinvertebrate metrics were calculated based on the methods included in *A Stream Condition Index for Virginia Non-Coastal Streams* (Tetra Tech, Inc. 2003). ATS biologists used the Ecological Data Application System (EDAS) to statistically rarify the samples to 110 organisms and calculate VSCI scores. The VSCI is used to compare streams to reference conditions to evaluate a streams current health. A stream must score a 61 or above to qualify as acceptable water quality. In order to calculate the VSCI the following metrics were calculated from the family level aquatic macroinvertebrate data: Taxa richness; Ephemeroptera, Plecoptera, Trichoptera (EPT) Index; Percent Ephemeroptera; Percent Plecoptera + Trichoptera (less Hydropsychidae); Percent Scrapers; Percent Chironomidae; Percent of top two dominant families; and Family Biotic Index (FBI). Tables with the macroinvertebrate data are attached in Appendix B.

C. *Physiochemical Water Data*

Prior to any field data collections, all handheld meters were calibrated. Four water quality parameters (specific conductance, dissolved oxygen, pH, and temperature) were analyzed using a handheld meter (YSI Pro Plus). Upon return to the lab all meters received a post-calibration check to ensure validity of all measurements recorded.

In addition to handheld meters, a surface water grab sample was collected at each sample site and delivered to Environmental Monitoring Inc. for analysis. Parameters analyzed were Acidity, Alkalinity (Bicarbonate), Alkalinity (Carbonate), Total Alkalinity, Hardness, Total Iron, Total Manganese, Nitrate, Nitrite, Total Cyanide, Total Dissolved Solids, Total Phenols, Total Suspended Solids, Total Boron, Total Magnesium, Total Aluminum, Total Antimony, Total Arsenic, Total Barium, Total Beryllium, Total Cadmium, Total Chromium, Total Cobalt, Total Copper, Total Lead, Total Nickel, Total Selenium, Total Silver, Total Thallium, Total Zinc, Total Mercury, Chloride, Sulfate, and Dissolved Organic Carbon. Grab sample analysis data can be found in Appendix C.

III. RESULTS

A. *Habitat Assessments*

The stream habitat at BRFK-3 scored 137 of 200 (Appendix A), indicating the habitat is partially supporting its designated use. The stream was approximately 20 feet wide and characterized mostly by a series of riffles and runs (Figures 2 and 3). Flow occupied >75% of the stream channel. Embeddedness was suboptimal with 25 to 50% of the substrate particles surrounded by fine sediment. The water was clear but there was slight deposition of sediment within the streambed. The stream banks were stable but the right bank had a narrow riparian zone.

B. *Macroinvertebrates*

Sample site BRFK-3 had low Taxa and EPT Richness (Tables 1 and 2). Sample site BRFK-3 had a FBI score of 5.92 indicating fairly poor water quality with substantial

pollution likely (Table 2). The VSCI score for the aquatic sample site ranged was 28.11 (Table 2).

C. Physiochemical Water Data

All handheld meters passed post-calibration tests. Specific conductance for the sample site was 1409 µS (Table 3). All other parameters recorded appeared to be within normal limits. The results of the water chemistry grab samples are attached in Appendix C.

IV. CONCLUSION

Based on RBP habitat data the sample site BRFK-3 appears to be somewhat impaired due to partially supporting habitat criterion. The sample site had a VSCI score below the impaired threshold of 61. All water parameters recorded with a handheld meter appeared to be within normal limits with an exception of an elevated specific conductance.

Figure 2: BRFK-3 upstream view

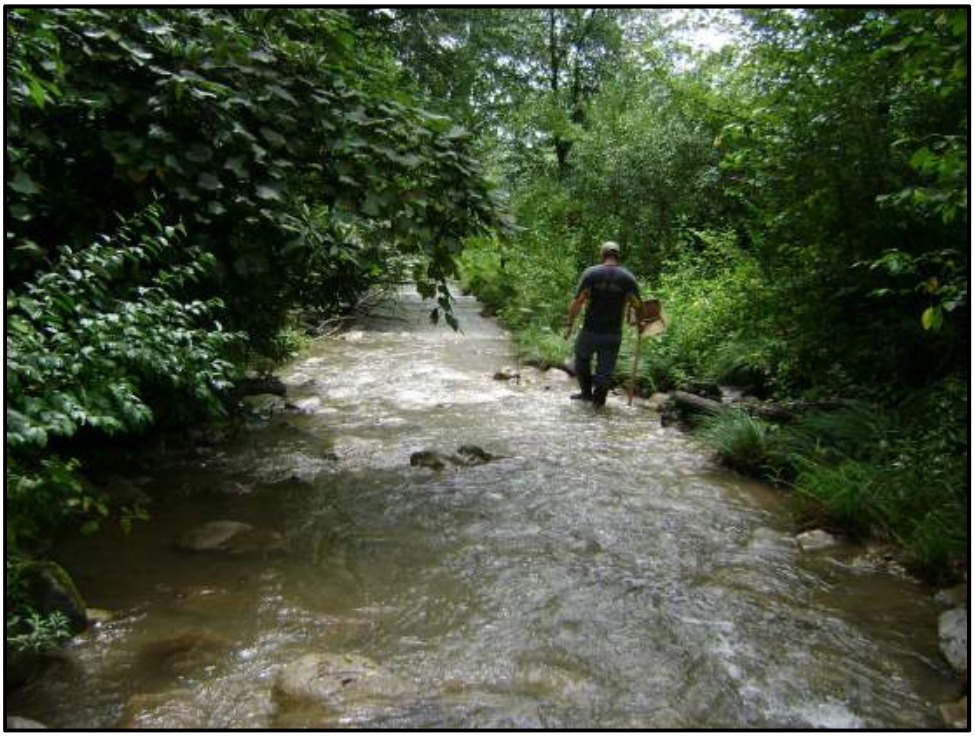

Figure 3: BRFK-3 downstream view

Literature Cited

Barbour, M. T., J. Gerritsen, B. D. Snyder, and J. B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C.

Kentucky Division of Water (KDOW), 2008. Methods for assessing biological integrity of surface waters in Kentucky, Revision 3. Kentucky Department of Environmental Protection, Division of Water, Frankfort, Kentucky.

Tetra Tech, Inc. 2003. A Stream Condition Index for Virginia Non-Coastal Streams. Tetra Tech, Inc. Owings Mills, Maryland. Prepared for Virginia Department of Environmental Quality, Richmond, Virginia.

APPENDIX A:

RBP DATA

Benthic MacroInvertebrate Field Data Sheet (front)

Station ID: 1199.01-BRFK3 Ecoregion: _____ Land Use: _____

Field Team: JEB, BWB Survey Reason: Bio. Monitoring Start Time: 13:30

Stream Name: Rocking Fork Location: Adjacent to old coke ovens Finish Time: 13:50

Date: 8/18/15 Latitude: 37.00022 Longitude: 82.72245

Stream Physicochemical

Instrument ID number: YSI-PRO pH: 8.32

Temperature: 18.9 C° Conductivity: 1409 µS/cm

Dissolved Oxygen: 8.62 mg/l Did instrument pass all post-calibration checks? Y/N

IF NO – which parameter(s) failed and action _____

Benthic Macroinvertebrate Collection

Method used (circle one) Single Habitat (Kick) Multi Habitat (Logs, plants, etc)

Riffle Quality (circle one) Good Marginal Poor None

Habitats sampled (circle one) Riffle Snags Banks Vegetation Area Sampled (sq. m): 2m²

Jabs _____ _____ _____ _____

Weather Observations

Current Weather (circle one) Cloudy Clear Rain/Snow Foggy

Recent precipitation (circle one) Clear Showers Rain Storms Other _____

Stream flow (circle one) Low Normal Above Normal Flood

INSTREAM WATERSHED FEATURES:

Stream Width 20 ft

Range of Depth 1.0 ft

Average Velocity _____ ft/s

Discharge _____ cfs

Est. Reach Length 100m

LOCAL WATERSHED FEATURES:

Predominant Surrounding Land Use:

0 Surface Mining	0 Construction	0 Forest
0 Deep Mining	0 Commercial	0 Pasture/Grazing
0 Oil Wells	0 Industrial	0 Silviculture
0 Land Disposal	0 Row Crops	0 Urban Runoff/Storm Sewers

Hydraulic Structures:
0 Dams 0 Bridge Abutments
0 Island 0 Waterfalls
0 Other

Stream Flow:
0 Dry 0 Pooled 0 Low 0 Normal
0 High 0 Very Rapid or Torrential

Stream Type:
0 Perennial 0 Intermittent
0 Ephemeral 0 Seep

Riparian Vegetation:
Dominate Type:
0 Trees 0 Shrubs
0 Grasses 0 Herbaceous
Number of strata 3

Dom. Tree/Shrub Taxa: Rododendron, Poplar

Canopy Cover:
0 Fully Shaded (75-100%)
0 Partially Shaded (50-75%)
0 Partially Exposed (25-50%)
0 Fully Exposed (0-25%)

Channel Alterations:
0 Dredging
0 Channelization
(0 Full 0 Partial)

Substrate 0 Est. 0 P.C. Riffle 70 % Run 30 % Pool 0 %

High Gradient Habitat Data Sheet

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/Available Cover	Greater than 70% of substrate favorable for epifauna colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e. logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
2. Embeddedness	Optimal: Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Suboptimal: Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Marginal: Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Poor: Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
3. Velocity/Depth Regime	Optimal: Cover All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). Slow is <0.3 m/s, deep is >0.5	Suboptimal: Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Marginal: Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Poor: Dominated by 1 velocity/depth regime (usually slow-deep).
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1

1199.01 - BRFK3

	Optimal	Suboptimal	Marginal	Poor
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent.
SCORE	20 19 18 17 16	15 14 (13) 12 11	10 9 8 7 6	5 4 3 2 1
	mis.			
	Optimal	Suboptimal	Marginal	Poor
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	(15) 14 13 12 11	10 9 8 7 6	5 4 3 2 1
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutements; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 - 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 (12) 11	10 9 8 7 6	5 4 3 2 1
	Optimal	Suboptimal	Marginal	Poor
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance btw. riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitats if key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance btw. riffles divided by the width of the stream is btw. 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance btw. riffles divided by the width of the stream is btw. 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance btw. riffles divided by the width of the stream is a ration of >25:1.
SCORE	20 19 18 17 16	15 (14) 13 12 11	10 9 8 7 6	5 4 3 2 1
	Optimal	Suboptimal	Marginal	Poor
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable, 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas "raw" areas
SCORE RB	10 9	(8) 7 6	5 4 3	2 1 0
SCORE LB	10 9	(8) 7 6	5 4 3	2 1 0
	Optimal	Suboptimal	Marginal	Poor
9. Vegetative Protection (score each bank)	More than 90% of the stream bank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of stream bank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the stream bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the stream bank surfaces covered by vegetation; disruption of stream bank vegetation is very high; vegetation has been removed to 5 cm or less in average stubble height.
SCORE RB	10 9	(8) 7 6	5 4 3	2 1 0
SCORE LB	10 9	(8) 7 6	5 4 3	2 1 0
	Optimal	Suboptimal	Marginal	Poor
10. Riparian Vegetative Zone Width (score each bank)	Width of riparian zone >18 m; human activities (i.e. parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 m; human activities have impacted zone only minimally.	Width of riparian zone 6-12 m; human activities have impacted zone a great deal.	Width if riparian zone <6 m; little or no riparian vegetation due to human activities.
SCORE RB	10 9	8 7 6	(6) 4 3	2 1 0
SCORE LB	10 (9)	8 7 6	5 4 3	2 1 0

SCORE 137

APPENDIX B:

TABLES

Table 1. Quantitative listings of macroinvertebrates collected 18 August 2015 from one aquatic sample site near Roaring Fork in Wise County, Virginia.

Order	Family	Fall 2015
		BRFK-3
Ephemeroptera	Baetidae	4
Trichoptera	Hydropsychidae	81
	Philopotamidae	
Diptera	Chironomidae	8
	Empididae	1
	Simuliidae	3
Annelida	Oligochaeta	7
		104

Table 2. VSCI metrics calculated from the macroinvertebrates collected 18 August 2015 at one aquatic sample site near Roaring Fork in Wise County, Virginia

Family Metrics	Fall 2015
	BRFK-3
Taxa Richness	6
EPT Taxa	2
% Ephemeroptera	3.85
% PT - Hydropsychidae	0.00
% Scrapers	0.00
% Chironomidae	7.69
% 2 Dominant	85.58
FBI	5.92
VSCI	28.11

Table 3. Physiochemical water data collected 18 August 2015 at one aquatic sample site near Roaring Fork in Wise County, Virginia.

Parameter	BRFK-3
Temperature (Celsius)	18.9
Specific Conductance (µs)	1409
pH	8.32
Dissolved Oxygen mg/l)	8.62

APPENDIX C:

GRAB SAMPLE ANALYSIS

ENVIRONMENTAL MONITORING, INCORPORATED
ENVIRONMENTAL CONSULTANTS ▲ ANALYTICAL LABORATORIES
5730 INDUSTRIAL PARK RD. ▲ NORTON, VIRGINIA 24273 ▲ 276/679-6544

Certificate of Analysis

Client Name: RED RIVER COAL COMPANY
Address: P.O. BOX 668
NORTON, VA 24273

Report Date: 09/01/15
Lab Sample No.: **1547256**
Client No.: 95
EMI Project No.: 97

Sample Identification: 1101760 - BRFK-3

Site Description:

Date Collected: 08/18/15
Time Collected: 1330
Sample Matrix: AQ
Collected By: J. BREEDING

Parameter	Sample Result	Units	MDL	RL	Method	Date Analyzed	Time Analyzed	Analyst
Acidity, Hot	BDL	mg/l CaCO3	4.00	4.00	SM 2310B-2011	8/19/2015	1141	THR
Alkalinity	209	mg/l CaCO3	4.00	4.00	SM 2320B-2011	8/19/2015	942	THR
Alkalinity, CO3 (Not NELAP)	4.03	mg/l CaCO3			SM 4500-CO2-D-2011	8/20/2015	1441	MRC
Alkalinity, HC03 (Not NELAP)	205	mg/l CaCO3			SM 4500-CO2-D-2011	8/20/2015	1441	MRC
Bromide	BDL MSF	mg/l	0.074	0.600	EPA 300.0	8/20/2015	1144	THR
Chloride	0.198 J	mg/l	0.165	5.00	EPA 300.0	8/19/2015	1838	THR
Conductivity	1429	umhos/cm	10.0	10.0	SM 2510B-2011	8/19/2015	1030	AKN
Cyanide, Total	BDL	ug/l	2.62	10.0	EPA 335.4	8/31/2015	1121	JLW
Flow, Measured (Not NELAP)	3704	gpm				8/18/2015	1330	FLD
Hardness, Total	596	mg/l CaCO3	4.00	4.00	SM 2340 C-2011	8/19/2015	1447	THR
Nitrate	0.808	mg/l	0.050	0.600	EPA 300.0	8/20/2015	1144	THR
Nitrite	0.827	mg/l	0.031	0.400	EPA 300.0	8/20/2015	1144	THR
pH (Not NELAP)	8.32	STD			SM 4500-H+B-2011	8/18/2015	1330	FLD
Sulfate	552	mg/l	0.568	25.0	EPA 300.0	8/19/2015	1851	THR
Total Dissolved Solids	1074	mg/l	1.00	1.00	SM 2540 C-2011	8/19/2015	954	JRS
Total Suspended Solids	5.90	mg/l	1.00	1.00	SM 2540 D-2011	8/18/2015	1744	TSE

To the best of our knowledge and belief, the collection, preservation, and analysis of all parameters represented by this report have been determined to comply the requirements as specified in 40 CFR, Part 136.
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VA Laboratory ID#: 460038
WV Laboratory ID#: 105
KY Laboratory ID#: 98012
EPA Laboratory ID#: VA00010

The release of this report is authorized by:

R. J. Porter
Technical Director

Flow if Avaliable (GPM): 3704.0
Temp. if Available (C): 18.9
Depth if Available (Ft):
Analysis Package Code: EPA0902R

PSCN
Rev-03-06-15

Type of Sample: Grab
BDL = Below Detection Limit
FLD = Field Technician
MR = Multiple analytical runs were used for this result
IV = Flag indicates Insufficient Sample Volume
SV = Sample volume indicated by method not used
AB = Analyte found in Method Blank
MSF = Matirx Spike Failure - Method in Control
EV = Estimated Value: Outside of calibration range

J = Flag indicates estimated value below Report Limit
T = Results indicate possible toxicity which is expected to influence reported value.
NA = A result for this analyte is not available.
MI = Matrix Interference - Final result may not be representative.
BQ = Batch QC Outside Acceptable Range
HE = Parameter Hold Time Exceeded
FC = Failure to Comply Current SOP
R = Sample results rejected because of gross deficiencies in QC or method performance .
DC = Duplicate did not meet method criteria, method process in control
P = Sample was not properly preserved for this parameter.

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Certificate of Analysis

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Client No.: 95
EMI Project No.: 97

Sample Identification: 1101760 - BRFK-3

Site Description:

Date Collected: 08/18/15
Time Collected: 1330
Sample Matrix: AQ
Collected By: J. BREEDING

Parameter	Sample Result	Units	MDL	RL	Method	Date Analyzed	Time Analyzed	Analyst
Aluminum, Total	0.105	mg/l	0.0092	0.050	200.7	8/20/2015	45	AWM
Antimony, Total	BDL	ug/l	0.204	2.00	200.8	8/19/2015	1801	CLS
Arsenic, Total	0.161 J	ug/l	0.041	2.00	200.8	8/19/2015	1801	CLS
Barium, Total	31.4	ug/l	0.140	2.00	200.8	8/19/2015	1801	CLS
Beryllium, Total	BDL	ug/l	0.036	2.00	200.8	8/19/2015	1801	CLS
Boron, Total	BDL	mg/l	0.016	0.030	200.7	8/20/2015	1348	AWM
Cadmium, Total	BDL	ug/l	0.027	2.00	200.8	8/19/2015	1801	CLS
Chromium, Total	0.301 J	ug/l	0.057	2.00	200.8	8/19/2015	1801	CLS
Cobalt, Total	0.176 J	ug/l	0.068	2.00	200.8	8/19/2015	1801	CLS
Copper, Total	0.372 J	ug/l	0.328	2.00	200.8	8/19/2015	1801	CLS
Iron, Total	0.279	mg/l	0.0091	0.050	200.7	8/20/2015	45	AWM
Lead, Total	0.103 J	ug/l	0.078	2.00	200.8	8/19/2015	1801	CLS
Magnesium, Total	58.8	mg/l	0.0069	0.500	EPA 200.7	8/19/2015	1501	AWM
Manganese, Total	0.050 J	mg/l	0.0016	0.050	200.7	8/20/2015	45	AWM
Mercury, Total	0.090 J	ug/l	0.062	0.500	EPA 245.1-REV.3	8/24/2015	1405	CLS
Nickel, Total	0.442 J	ug/l	0.088	2.00	200.8	8/19/2015	1801	CLS
Selenium, Total	2.57	ug/l	0.457	2.00	200.8	8/21/2015	1125	CLS

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Certificate of Analysis

Client Name: RED RIVER COAL COMPANY
Address: P.O. BOX 668
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Report Date: 09/01/15
Lab Sample No.: **1547256**
Client No.: 95
EMI Project No.: 97

Sample Identification: 1101760 - BRFK-3
Site Description:

Date Collected: 08/18/15
Time Collected: 1330
Sample Matrix: AQ
Collected By: J. BREEDING

Parameter	Sample Result	Units	MDL	RL	Method	Date Analyzed	Time Analyzed	Analyst
Silver, Total	BDL	ug/l	0.061	2.00	200.8	8/19/2015	1801	CLS
Thallium, Total	BDL	ug/l	0.222	2.00	200.8	8/19/2015	1801	CLS
Zinc, Total	BDL	ug/l	1.25	5.00	200.8	8/19/2015	1801	CLS

Client Sample Results

Client: Environmental Monitoring, Inc.
Project/Site: 95.97

TestAmerica Job ID: 680-115861-2

Client Sample ID: 1547255 BPR-1

Lab Sample ID: 680-115861-2
Date Collected: 08/18/15 12:45
Matrix: Water
Date Received: 08/20/15 10:15

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	0.025	U	0.050	0.025	mg/L		08/26/15 15:05	08/26/15 17:44	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	1.7		1.0	0.50	mg/L			08/24/15 13:00	1

Client Sample ID: 1547256 BRFK-3

Lab Sample ID: 680-115861-3
Date Collected: 08/18/15 13:20
Matrix: Water
Date Received: 08/20/15 10:15

General Chemistry

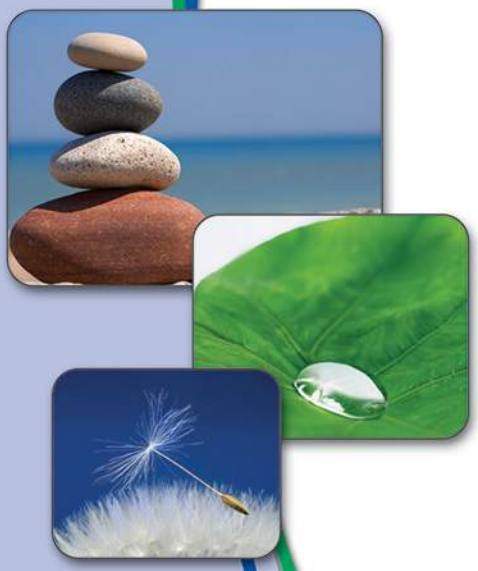
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	0.025	U	0.050	0.025	mg/L		08/26/15 15:05	08/26/15 17:51	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	1.3		1.0	0.50	mg/L			08/24/15 13:00	1

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING



ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

TestAmerica Job ID: 680-115861-2
Client Project/Site: 95.97

For:
Environmental Monitoring, Inc.
5730 Industrial Park Avenue
Norton, Virginia 24273

Attn: Donna Phillips

Authorized for release by:
8/27/2015 5:18:56 PM

Sheila Hoffman, Project Manager II
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Job ID: 680-115861-2

Laboratory: TestAmerica Savannah

Narrative

CASE NARRATIVE

Client: Environmental Monitoring, Inc.

Project: 95.97

Report Number: 680-115861-2

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

RECEIPT
The samples were received on 08/20/2015; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.8 C.

PHENOLS
Samples 1547255 BPR-1 (680-115861-2) and 1547256 BRFK-3 (680-115861-3) were analyzed for phenols in accordance with EPA Method 420.1. The samples were prepared and analyzed on 08/26/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DOC
Samples 1547255 BPR-1 (680-115861-2) and 1547256 BRFK-3 (680-115861-3) were analyzed for DOC in accordance with SM 5310_DOC_C. The samples were analyzed on 08/24/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Sample Summary

Client: Environmental Monitoring, Inc.
Project/Site: 95.97

TestAmerica Job ID: 680-115861-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-115861-2	1547255 BPR-1	Water	08/18/15 12:45	08/20/15 10:15
680-115861-3	1547256 BRFK-3	Water	08/18/15 13:20	08/20/15 10:15

Method Summary

Client: Environmental Monitoring, Inc.
Project/Site: 95.97

TestAmerica Job ID: 680-115861-2

Method	Method Description	Protocol	Laboratory
420.1	Phenolics, Total Recoverable	MCAWW	TAL SAV
SM 5310C	Organic Carbon, Dissolved (DOC)	SM	TAL NSH

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
SM = "Standard Methods For The Examination Of Water And Wastewater",

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177
TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Definitions/Glossary

Client: Environmental Monitoring, Inc.
Project/Site: 95.97

TestAmerica Job ID: 680-115861-2

Qualifiers

General Chemistry

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

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Method: 420.1 - Phenolics, Total Recoverable

Lab Sample ID: MB 680-398195/1-A
Matrix: Water
Analysis Batch: 398304

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 398195

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	0.025	U	0.050	0.025	mg/L		08/26/15 15:05	08/26/15 17:37	1

Lab Sample ID: LCS 680-398195/2-A
Matrix: Water
Analysis Batch: 398304

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 398195

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0969		mg/L		97	75 - 125

Lab Sample ID: LCSD 680-398195/3-A
Matrix: Water
Analysis Batch: 398304

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 398195

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phenolics, Total Recoverable	0.100	0.0959		mg/L		96	75 - 125	1	30

Method: SM 5310C - Organic Carbon, Dissolved (DOC)

Lab Sample ID: MB 490-276210/1
Matrix: Water
Analysis Batch: 276210

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	0.50	U	1.0	0.50	mg/L			08/24/15 13:00	1

Lab Sample ID: LCS 490-276210/4
Matrix: Water
Analysis Batch: 276210

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Organic Carbon	10.0	9.85		mg/L		99	90 - 110

QC Association Summary

Client: Environmental Monitoring, Inc.
Project/Site: 95.97

TestAmerica Job ID: 680-115861-2

General Chemistry

Analysis Batch: 276210

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-115861-2	1547255 BPR-1	Dissolved	Water	SM 5310C	
680-115861-3	1547256 BRFK-3	Dissolved	Water	SM 5310C	
LCS 490-276210/4	Lab Control Sample	Dissolved	Water	SM 5310C	
MB 490-276210/1	Method Blank	Dissolved	Water	SM 5310C	

Prep Batch: 398195

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-115861-2	1547255 BPR-1	Total/NA	Water	Distill/Phenol	
680-115861-3	1547256 BRFK-3	Total/NA	Water	Distill/Phenol	
LCS 680-398195/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
LCSD 680-398195/3-A	Lab Control Sample Dup	Total/NA	Water	Distill/Phenol	
MB 680-398195/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 398304

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-115861-2	1547255 BPR-1	Total/NA	Water	420.1	398195
680-115861-3	1547256 BRFK-3	Total/NA	Water	420.1	398195
LCS 680-398195/2-A	Lab Control Sample	Total/NA	Water	420.1	398195
LCSD 680-398195/3-A	Lab Control Sample Dup	Total/NA	Water	420.1	398195
MB 680-398195/1-A	Method Blank	Total/NA	Water	420.1	398195

Login Sample Receipt Checklist

Client: Environmental Monitoring, Inc.

Job Number: 680-115861-2

Login Number: 115861
List Number: 2
Creator: Armstrong, Daniel

List Source: TestAmerica Nashville
List Creation: 08/22/15 08:28 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.0C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Certification Summary

Client: Environmental Monitoring, Inc.
Project/Site: 95.97

TestAmerica Job ID: 680-115861-2

Laboratory: TestAmerica Savannah

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Virginia	NELAP	3	460161	06-14-16

Laboratory: TestAmerica Nashville

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Virginia	NELAP	3	460152	06-14-16

EPA/RPA PROJECTS CHAIN OF CUSTODY

ENVIRONMENTAL MONITORING, INC

P.O. BOX 1190 * NORTON VA 24273 * 276-679-6544

SUB-WORK REQUIRED
COPY TO CLIENT

C041929

Permit # 1101760

Proj. Description: 1199.01	EPA Sampling
EMI Project #: 95.97	Emi Project Manager: RJP
COLLECTED BY: James Breeding + Brian Bledsoe	

							EPA 0902R BROMIDE	TOTAL METALS, HARDNESS	DISSOLVED ORGANIC CARBON	PHENOLS	CYANIDE	~~DISSOLVED~~ METALS				
							PRESERVATIVE USED:									
EMI NO.	EMI SAMPLE #	CUSTOMER SAMPLE IDENTIFICATION	DATE COLLECTED	TIME COLLECTED	SAMPLE MATRIX	NO. OF CONT.	COOL < 6°C	HNO_3	FILT. HCL	H_2SO_4	NaOH	FILT. HNO_3	PH	TEMP	FLOW	REMARKS GPM FLOWS
	154725	BPR-1 ✓	8-18-15	12:45	AQ	6							8.20	17.8	0.187	84
	256	BRFK-3 ✓	8-18-15	13:30	AQ	6							8.32	18.9	8.268	3704

All samples requiring pH preservation were verified to be as indicated on COC by: [signature]
Date: 8-18-15 Time: 1535

BIN # 04 EMI pH Meter # _____

COOLER TEMP 3.6° C (1360) CHECKED BY: [signature] Number of Containers this Page: 12

Relinquished by: [signature] Date: 8/18/15 Time: 1535 Received by: _____

Relinquished by: _____ Date: ____/____/____ Time: _____ Received by: _____

Updated 09/16/13